

wePilot3000

Flight Control System for Rotary-Wing UAS



1 Overview

The wePilot3000 family is a flight control system for small rotary and fixed wing unmanned aircraft systems. It consists of a PCB stack which integrates an embedded computer system, a GPS receivers, a magnetometer, an IMU with three gyros and three accelerometers, an absolute and differential pressure sensor. All onboard power supply converters are doubled for redundancy. The PCB stack comes either as OEM version with a PCB mounting connector or packaged in an aluminium/plastic housing with a military type of connector.

The wePilot3000 family combines integrated GPS/inertial navigation with robust controller design methodologies to provide attitude stabilization, velocity and

position control, motor speed and airspeed control. Guidance algorithms allow accurate trajectory tracking even under high wind conditions.

Various interfaces (RS-232/485, digital I/O, analog inputs, S-bus inputs, PWM inputs/outputs) allow to read external sensors and to control custom payload equipments. A data-link may be added to interface with the weGCS ground control station.

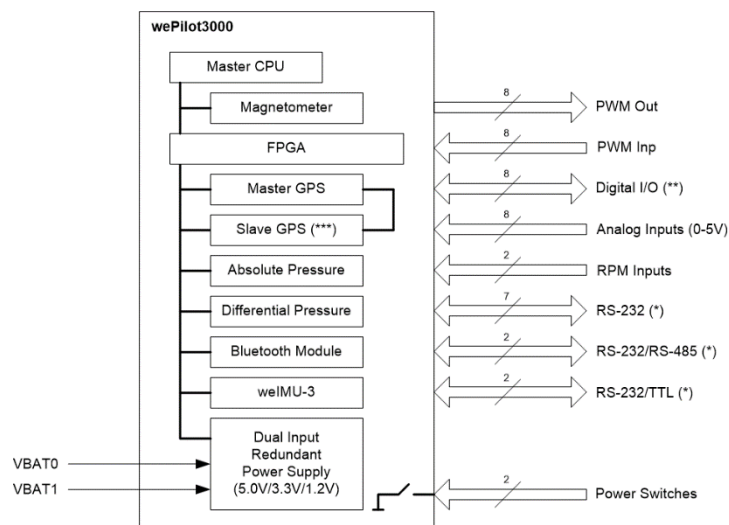
The wePilot3000 comes with different options: Built-in IMU or external IMU, L1 or L1/L2 GPS receiver, 1 or 2 GPS receivers for position redundancy, Novatel's Align option for accurate GPS heading.

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Specification

	wePilot3000	
CPU		
PXA255, 400MHz, 64kB RAM, 32kB ROM	1	
FPGA Spartan-6	1	
Sensors		
Onboard magnetometer	1	
Novatel OEM615 L1/L2 with Glonass	1/2	
Absolute pressure sensor	1034	hPa
Differential pressure sensor	±68	hPa
Interfaces		
Serial interfaces		
RS-232	7	
RS-232 or RS-485	2	
RS-232 or TTL	2	
USB		
Bluetooth module (serial)	1	
PWM inputs/outputs		
Resolution	100	ns
S-Bus receiver interfaces	2	
Digital I/O	8	
Analog inputs (0 - 5 Volts)	8	
Frequency counters (RPM Sensor)	2	
Power switches (max. 2A)	2	
Environment		
Operating temperature	-40 to +85	°C
Electrical		
Input voltage	10-18	VDC
Supply current (@12VDC)	1000	mA
Physical		
Size (L x W x H)	80 x 80 x 76	mm
Weight	400	g

Functional Block Diagram



(*) Total number of available serial ports may be less depending on port configuration
 (**) DIO6 = S-Bus receiver input 0, DIO7 = S-Bus receiver input 1
 (***) Only available when GPS heading option chosen